

CLAIMS

WHAT IS CLAIMED IS:

1. A dehumidification unit comprising alternate laminations of an adsorption element (1) which supports an adsorbent and in which a plurality of first air ventilation passages (3, 3, ...) through which air (Aa) to be processed flows are formed planewise in rows, and a cooling element (2) in which a plurality of second air ventilation passages (4, 4, ...) through which cooling air (Ab) flows are formed planewise in rows,

wherein:

said cooling element (2) is provided, at a planewise inner area thereof, with an opening (24), thereby being shaped like a frame, and

each of said second air ventilation passages (4, 4, ...) is divided by said opening (24) into an entry opening (4a) and an exit opening (4b) situated respectively on one passagewise side and on the other passagewise side thereof.

2. A dehumidification unit comprising alternate laminations of an adsorption element (1) which supports an adsorbent and in which a plurality of first air ventilation passages (3, 3, ...) through which air (Aa) to be processed flows are formed planewise in rows, and a cooling element (2) in which a plurality of second air ventilation passages (4, 4, ...) through which cooling air (Ab) flows are formed planewise in rows,

wherein each of said second air ventilation passages (4, 4, ...) of said cooling element (2) has an approximately rectangular cross-sectional shape.

3. The dehumidification unit of claim 1, wherein each of said second air ventilation passages (4, 4, ...) of said cooling element (2) has an approximately rectangular cross-sectional shape.

4. The dehumidification unit of claim 1, wherein each of said second air ventilation passages (4, 4, ...) of said cooling element (2) has an approximately triangular cross-sectional shape.

5. The dehumidification unit of any one of claims 1, 3, and 4, wherein air stream regulating means (X), configured to inhibit the flow of said cooling air (Ab) from deviating in the inside of said opening part (24), is disposed in said opening (24) of said cooling element (2).

6. The dehumidification unit of any one of claims 1, 3, and 4 further comprising flow rate regulating means (Y) disposed on the side of said entry openings (4a, 4a, ...) of said second air ventilation passages (4, 4, ...),

whereby the flow rate of said cooling air (Ab) entering the inside of said opening (24) through each of said entry openings (4a, 4a, ...) is so regulated as to become higher the nearer to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

7. The dehumidification unit of claim 6, wherein said flow rate regulating means (Y) is formed by setting the passage length of said entry openings (4a, 4a, ...) of said second air ventilation passages (4, 4, ...) to become shorter the nearer to the downstream end of said first air ventilation passages (3, 3, ...).

8. A dehumidification unit comprising alternate laminations of an adsorption element (1) which supports an adsorbent and in which a plurality of first air ventilation passages (3, 3, ...) through which air (Aa) to be processed flows are formed planewise in rows, and a cooling element (2) in which a plurality of second air ventilation passages (4, 4, ...) through which cooling air (Ab) flows are formed planewise in rows,

wherein:

said cooling element (2) is provided with openings (24A, 24B) which overlap with said second air ventilation passages (4, 4, ...) such that said second air ventilation passages (4, 4, ...) are each divided passagewise, and

the passage resistance of said second air ventilation passages (4, 4, ...) on the downstream side of said openings (24A, 24B) is set such that the passage resistance of second air ventilation passages nearer to an area (2c) of said cooling element (2) corresponding to the upstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) is greater than the passage resistance of second air ventilation passages nearer to an area (2d) of said cooling element (2) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

9. The dehumidification unit of claim 8, wherein the passage length of said second air ventilation passages (4, 4, ...) on the downstream side of said openings (24A, 24B) is set such that the passage length of second air ventilation passages nearer to said area (2c) corresponding to the upstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) is greater than the passage length of second air ventilation passages nearer to said area (2d) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

10. The dehumidification unit of claim 9, wherein the passage length of said second air ventilation passages (4, 4, ...) is set so as to become gradually shorter from the side nearer to said area (2c) corresponding to the upstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) towards the side nearer to said area (2d) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

11. The dehumidification unit of claim 9, wherein the passage length of said second air ventilation passages (4, 4, ...) is set so as to become linearly shorter from the side nearer to said area (2c) corresponding to the upstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) towards the side nearer to said area (2d) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

12. The dehumidification unit of claim 9, wherein the passage length of said second air ventilation passages (4, 4, ...) is set so as to become curvedly shorter from the side nearer to the area (2c) corresponding to the upstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) towards the side nearer to said area (2d) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

13. The dehumidification unit of claim 8, wherein the passage cross-sectional area of said second air ventilation passages (4, 4, ...) on the downstream side of said openings (24A, 24B) is set such that the passage cross-sectional area of second air ventilation passages nearer to said area (2c) corresponding to the upstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) is smaller than the passage cross-sectional area of second air ventilation passages (4) nearer to said area (2d) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

14. The dehumidification unit of claim 9, wherein the passage cross-sectional area of said second air ventilation passages (4, 4, ...) on the downstream side of said openings (24A, 24B) is set such that the passage cross-sectional area of second air ventilation passages nearer to said area (2c) corresponding to the upstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) is smaller than the passage

cross-sectional area of second air ventilation passages (4) nearer to said area (2d) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1).

15 15. A dehumidification unit comprising alternate laminations of an adsorption element (1) which supports an adsorbent and in which a plurality of first air ventilation passages (3, 3, ...) through which air (Aa) to be processed flows are formed planewise in rows, and a cooling element (2) in which a plurality of second air ventilation passages (4, 4, ...) through which cooling air (Ab) flows are formed planewise in rows,

wherein:

10 said cooling element (2) is provided with openings (24A, 24B) which overlap with said second air ventilation passages (4, 4, ...) such that said second air ventilation passages (4, 4, ...) are each divided passagewise, and

the passage direction of said second air ventilation passages (4, 4, ...) on the downstream side of said openings (24A, 24B) as viewed in plane view is inclined so as to
15 get closer to an area (2d) of said cooling element (2) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) with approach towards the downstream side.

16. The dehumidification unit of any one of claims 8, 9, 13, and 14, wherein the passage direction of said second air ventilation passages (4, 4, ...) on the downstream side
20 of said openings (24A, 24B) as viewed in plane view is inclined so as to get closer to said area (2d) of said cooling element (2) corresponding to the downstream side of said first air ventilation passages (3, 3, ...) of said adsorption element (1) with approach towards the downstream side.

17. The dehumidification unit of any one of claims 8, 9, 13, 14, and 15, wherein
25 a plurality of sets of said openings (24A, 24B) and said second air ventilation passages (4,

4, ...) situated downstream of said openings (24A, 24B) are provided in a back-and-forth arrangement relative to the flow direction of said cooling air (Ab) in said cooling element (2).